Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A method for co-modelling a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, the method comprising the steps of:

(1) generating a basic packet capacity comprising a capacity value for each packet link based on packet network topology information and packet traffic information; and

(2) generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity.

2. (Previously presented) A method for co-modelling according to claim 1, wherein the step of generating a basic packet capacity further comprises the steps of:

(1) combining the packet network topology information in the form of a packet network topology input and the packet traffic information in the form of a packet traffic matrix input to create the simulated packet network; and

(2) assigning each packet link of the simulated packet network a flow to create the basic packet capacity for the simulated packet network; and

wherein the step of generating a basic optical capacity comprises the steps of:

(3) combining the optical network topology information in the form of an optical network topology input and the basic packet capacity to form the simulated optical network; and

(4) assigning each optical link of the simulated optical network a flow to create the basic optical capacity for the simulated optical network.

3. (Previously presented) A method for co-modelling according to claim 2, the method further comprising the steps of:

(1) supplying the packet network topology input;

(2) supplying the packet traffic matrix input; and

(3) supplying the optical network topology input;

4. (Previously presented) A method for co-modelling according to claim 2, further comprising generating the packet network topology input, the packet traffic matrix input and the optical network topology input for use in co-modelling the simulated packet network and the simulated optical network over which the simulated packet network operates.

5. (Previously presented) A method for co-modelling according to claim 2, wherein the packet network topology input comprises information regarding a plurality of routers in the simulated packet network, information regarding source-destination router ordered pairs in the simulated packet network, and information regarding a plurality of packet links in the simulated packet network, wherein assigning each packet link of the simulated packet network a flow comprises the steps of:

(1) setting capacity to zero for all packet links;

(2) performing a series of steps, as follows, for each source-destination router ordered pair;

A. determining a shortest packet path between routers;

B. establishing a source-destination packet traffic flow based on the shortest packet path; and

C. incrementing capacity of each packet link traversed by the packet traffic flow; and

(3) increasing capacity of packet links per packet network engineering guidelines.

6. (Previously presented) A method for co-modelling according to claim 2, wherein the optical network topology input comprises information regarding a plurality of cross-connect switches in the simulated optical network and information regarding a plurality of optical links in the simulated optical network, wherein assigning each optical link of the simulated optical network a flow comprises the steps of:

(1) setting capacity to zero for all optical links;

(2) performing a series of steps, as follows, for each packet link between two routers;

A. determining a shortest optical path between cross-connect switches supporting the two routers;

B. establishing an optical connection to support the packet link; and

C. incrementing capacity of each optical link traversed by the optical connection; and

(3) increasing capacity of optical links per optical network engineering guidelines.

7. (Previously presented) A method for co-modelling according to claim 5, wherein the optical network topology input comprises information regarding a plurality of cross-connect switches in the simulated optical network and information regarding a plurality of optical links in the simulated optical network, wherein assigning each optical link of the simulated optical network a flow comprises the steps of:

(1) setting capacity to zero for all optical links;

(2) performing a series of steps, as follows, for each packet link between two routers;

A. determining a shortest optical path between cross-connect switches supporting the two routers;

B. establishing an optical connection to support the packet link; and

C. incrementing capacity of each optical link traversed by the optical connection; and

(3) increasing capacity of optical links per optical network engineering guidelines.

8. (Previously presented) A method for co-modelling and analyzing a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, the method comprising the steps of:

(1) generating a basic packet capacity comprising a capacity value for each packet link based on packet network topology information and packet traffic information; and

(2) generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity; and

(3) performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates.

9. (Previously presented) A method for co-modelling and analyzing according to claim 8, wherein the step of generating a basic packet capacity further comprises the steps of:

(1) combining the packet network topology information in the form of a packet network topology input and the packet traffic information in the form of a packet traffic matrix input to create the simulated packet network; and

(2) assigning each packet link of the simulated packet network a flow to create the basic packet capacity for the simulated packet network; and

wherein the step of generating a basic optical capacity comprises the steps of:

(3) combining the optical network topology information in the form of an optical network topology input and the basic packet capacity to form the simulated network; and

(4) assigning each optical link of the simulated optical network a flow to create the basic optical capacity for the simulated optical network.

10. (Previously presented) A method for co-modelling and analyzing according to claim 8, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises analyzing survivability of the simulated packet network and the simulated optical network over which the simulated packet network operates.

11. (Previously presented) A method for co-modelling and analyzing according to claim 8, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises network capacity planning of the simulated packet network and the simulated optical network over which the simulated packet network operates.

12. (Previously presented) A method for co-modelling and analyzing according to claim 8, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises performing survivability analysis, wherein an optical failure is known to occur within the simulated optical network, the step further comprising the steps of:

(1) establishing at least one protection mechanism for each point-to-point connection in the simulated packet network;

(2) performing a series of steps, as follows, for each optical link in the simulated optical network;

A. switching all affected packet traffic flow to an at least one protection mechanism;

B. incrementing capacity of each optical link traversed by the at least one protection mechanism; and

C. restoring initial capacity values; and

(3) summing capacity requirements.

13. (Previously presented) A method for co-modelling and analyzing according to claim 9, wherein the step of performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises performing survivability analysis, wherein an optical failure is known to occur within the simulated optical network, the step further comprising the steps of:

(1) establishing at least one protection mechanism for each point-to-point connection in the simulated packet network;

(2) performing a series of steps, as follows, for each optical link in the simulated optical network;

A. switching all affected packet traffic flow to an at least one protection mechanism;

B. incrementing capacity of each optical link traversed by the at least one protection mechanism; and

C. restoring initial capacity values; and

(3) summing capacity requirements.

14. (Previously presented) A method for analyzing survivability of a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, wherein an optical failure is known to occur within the simulated optical network and

wherein packet link protection is performed in the simulated packet network, the method comprising the steps of:

(1) establishing at least one back-up packet traffic flow tunnel for each packet link in the simulated packet network;

(2) performing a series of steps, as follows, for each optical link in the simulated optical network;

A. taking an optical link out of service;

B. performing a series of steps, as follows, in a nested process for each packet link affected by the optical failure;

i. switching all packet traffic flow on the affected packet link to an at least one back-up packet traffic flow tunnel;

ii. incrementing capacity of each packet link traversed by the at least one back-up packet traffic flow tunnel; and

iii. incrementing capacity of each optical link traversed by an optical connection supporting the packet link; and

C. restoring initial capacity values; and

(3) summing packet link capacity requirements and optical link capacity requirements.

15. (Currently amended) A method for analyzing survivability of a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, wherein an optical failure is known to occur within the simulated optical network and wherein packet link protection is performed in the simulated optical network, the method comprising the steps of:

(1) establishing at least one protection tunnel for each optical connection in the simulated optical network;

(2) performing a series of steps, as follows, for each optical link in the simulated optical network;

A. taking ~~an~~ the optical link out of service;

B. switching all affected optical connections to an at least one protection tunnel;

C. incrementing capacity of each optical link traversed by the at least one protection tunnel; and

D. restoring initial capacity values; and

(3) summing the optical link capacity requirements.

16. (Original) The method according to claim 14, wherein the packet traffic flow is LSP (Label Switch Path) traffic flow.

17. (Previously presented) A computer readable medium having computer executable instructions stored thereon for execution by a computer processor, for, when executed, co-modelling a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, the computer executable instructions comprising:

(1) computer executable instructions for generating a basic packet capacity comprising a capacity value for each packet link based on packet network topology information and packet traffic information; and

(2) computer executable instructions for generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity.

18. (Previously presented) A computer readable medium having computer executable instructions according to claim 17, wherein the computer executable instructions for generating a basic packet capacity comprise:

(1) computer executable instructions for combining the packet network topology information in the form of a packet network topology input and the packet traffic information in the form of a packet traffic matrix input to create the simulated packet network; and

(2) computer executable instructions for assigning each packet link of the simulated packet network a flow to create the basic packet capacity for the simulated packet network; and

wherein the computer executable instructions for generating a basic optical capacity comprise:

(3) computer executable instructions for combining the optical network topology information in the form of an optical network topology input and the basic packet capacity to form the simulated optical network; and

(4) computer executable instructions assigning each optical link of the simulated optical network a flow to create the basic optical capacity for the simulated optical network.

19. (Previously presented) A computer readable medium having computer executable instructions according to claim 18, the computer executable instructions comprising:

(1) computer executable instructions for receiving a packet network topology input;

(2) computer executable instructions for receiving a packet traffic matrix input; and

(3) computer executable instructions for receiving an optical network topology input.

20. (Previously presented) A computer readable medium having computer executable instructions according to claim 18, further comprising computer executable instructions for generating the packet network topology input, the packet traffic matrix input and the optical network topology input for use in co-modelling the simulated packet network and the simulated optical network over which the simulated packet network operates.

21. (Previously presented) A computer readable medium having computer executable instructions according to claim 18, wherein the packet network topology input comprises information regarding a plurality of routers in the simulated packet network, information regarding source-destination router ordered pairs in the simulated packet network, and information regarding a plurality of packet links in the simulated packet network, wherein computer executable instructions for assigning each packet link of the simulated packet network a flow comprises computer executable instructions for:

(1) setting capacity to zero for all packet links;

(2) performing a series of steps, as follows, for each source-destination router ordered pair;

A. determining a shortest packet path between routers;

B. establishing a source-destination packet traffic flow based on the shortest packet path;

C. incrementing capacity of each packet link traversed by the packet traffic flow; and

(3) increasing capacity of packet links per packet network engineering guidelines.

22. (Previously presented) A computer readable medium having computer executable instructions according to claim 18, wherein the optical network topology input comprises information regarding a plurality of cross-connect switches in the simulated optical network and information regarding a plurality of optical links in the simulated optical network, wherein

computer executable instructions for assigning each optical link of the simulated optical network a flow further comprises computer executable instructions for:

(1) setting capacity to zero for all optical links;

(2) performing a series of steps, as follows, for each packet link between two routers;

A. determining a shortest optical path between cross-connect switches supporting the two routers;

B. establishing an optical connection to support the packet link; and

C. incrementing capacity of each optical link traversed by the optical connection; and

(3) increasing capacity of optical links per optical network engineering guidelines.

23. (Previously presented) A computer readable medium having computer executable instructions according to claim 21, wherein the optical network topology input comprises information regarding a plurality of cross-connect switches in the simulated optical network and information regarding a plurality of optical links in the simulated optical network, wherein computer executable instructions for assigning each optical link of the simulated optical network a flow comprises computer executable instructions for:

(1) setting capacity to zero for all optical links;

(2) performing a series of steps, as follows, for each packet link between two routers;

A. determining a shortest optical path between cross-connect switches supporting the two routers;

B. establishing an optical connection to support the packet link; and

C. incrementing capacity of each optical link traversed by the optical connection; and

(3) increasing capacity of optical links per optical network engineering guidelines.

24. (Previously presented) A computer readable medium having computer executable instructions stored thereon for execution by a computer processor, for, when executed, co-modelling and analyzing a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, the computer executable instructions comprising:

(1) computer executable instructions for generating a basic packet capacity comprising a capacity value for each packet link based on packet network topology information and packet traffic information;

(2) computer executable instructions for generating a basic optical capacity comprising a capacity value for each optical link based on optical network topology information and the basic packet capacity; and

(3) computer executable instructions for performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates.

25. (Previously presented) A computer readable medium having computer executable instructions according to claim 24, wherein the computer executable instructions for generating a basic packet capacity comprise:

(1) computer executable instructions for combining the packet network topology information in the form of a packet network topology input and the packet traffic information in the form of a packet traffic matrix input to create the simulated packet network; and

(2) computer executable instructions for assigning each packet link of the simulated packet network a flow to create the basic packet capacity for the simulated packet network; and

wherein the computer executable instructions for generating a basic optical capacity comprise;

(3) the computer executable instructions for combining the optical network topology information in the form of an optical network topology input and the basic packet capacity to form the simulated optical network; and

(4) the computer executable instructions for assigning each packet link of the simulated optical network a flow to create the basic optical capacity for the simulated optical network.

26. (Previously presented) A computer readable medium having computer executable instructions according to claim 24, wherein the computer executable instructions for performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises computer executable instructions for analyzing survivability of the simulated packet network and the simulated optical network over which the simulated packet network operates.

27. (Previously presented) A computer readable medium having computer executable instructions according to claim 24, wherein the computer executable instructions for performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprises computer executable instructions for network capacity planning of the simulated packet network and the simulated optical network over which the simulated packet network operates.

28. (Previously presented) A computer readable medium having computer executable instructions according to claim 24, wherein the computer executable instructions for performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprise computer executable instructions for performing

survivability analysis, wherein an optical failure is known to occur within the simulated optical network, the computer executable instructions comprising:

(1) computer executable instructions for establishing at least one protection mechanism for each point-to-point connection in the simulated packet network;

(2) computer executable instructions for performing a series of steps, as follows, for each optical link in the simulated optical network;

A. switching all affected packet traffic flow to an at least one protection mechanism;

B. incrementing capacity of each optical link traversed by the at least one protection mechanism; and

C. restoring initial capacity values; and

(3) computer executable instructions for summing capacity requirements.

29. (Previously presented) A computer readable medium having computer executable instructions according to claim 25, wherein the computer executable instructions for performing analysis on the simulated packet network and the simulated optical network over which the simulated packet network operates comprise computer executable instructions for performing survivability analysis, wherein an optical failure is known to occur within the simulated optical network, the computer executable instructions comprising:

(1) computer executable instructions for establishing at least one protection mechanism for each point-to-point connection in the simulated packet network;

(2) computer executable instructions for performing a series of steps, as follows, for each optical link in the simulated optical network;

A. switching all affected packet traffic flow to an at least one protection mechanism;

B. incrementing capacity of each optical link traversed by the at least one protection mechanism; and

C. restoring initial capacity values; and

(3) computer executable instructions for summing capacity requirements.

30. (Currently amended) A computer readable medium having computer executable instructions stored thereon for execution by a computer processor, for, ~~when executed analyzing~~ when executed, analyzing survivability of a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, wherein an optical failure is known to occur within the simulated optical network and wherein packet link protection is performed in the simulated packet network, the computer executable instructions comprising:

(1) computer executable instructions for establishing at least one back-up packet traffic flow tunnel for each packet link in the simulated packet network;

(2) computer executable instructions for performing a series of steps, as follows, for each optical link in the simulated optical network;

A. taking ~~an~~ the optical link out of service;

B. performing a series of steps, as follows, in a nested process for each packet link affected by the optical failure;

i. switching all packet traffic flow on the affected packet link to an at least one back-up packet traffic flow tunnel;

ii. incrementing capacity of each packet link traversed by the at least one back-up packet traffic flow tunnel; and

iii. incrementing capacity of each optical link traversed by an optical connection supporting the packet link; and

C. restoring the initial capacity values; and

(3) computer executable instructions for summing packet link capacity requirements and optical link capacity requirements.

31. (Currently amended) A computer readable medium having computer executable instructions stored thereon for execution by a computer processor, for, ~~when executed analyzing~~ when executed, analyzing survivability of a simulated packet network and a simulated optical network over which the simulated packet network operates, the simulated packet network representing a plurality of packet links between packet network nodes and the simulated optical network representing a plurality of optical links between optical network nodes, wherein an optical failure is known to occur within the simulated optical network and wherein packet link protection is performed in the simulated optical network, the computer executable instructions comprising:

(1) computer executable instructions for establishing at least one protection tunnel for each optical connection in the simulated optical network;

(2) computer executable instructions for performing a series of steps, as follows, for each optical link in the simulated optical network;

A. taking ~~an~~ the optical link out of service;

B. switching all affected optical connections to an at least one protection tunnel;

C. incrementing capacity of each optical link traversed by the at least one protection tunnel; and

D. restoring initial capacity values; and

(3) computer executable instructions for summing the optical link capacity requirements.

32. (Previously presented) The computer readable medium having a executable instructions according to claim 30, wherein the packet traffic flow is LSP (Label Switch Path) traffic flow.